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Remarks

Applicants thank the Examiner for extending to the undersigned attorney the courtesy of an applicant-initiated in-person interview on May 1, 2003. As required by the recent changes in MPEP §713.04 (eighth edition, revision 1), applicants have supplemented the substance of the interview in these Remarks. For ease of understanding, information relating to the interview is identified using the phrase "during the interview".

As discussed during the interview, claim 33 has been amended to recite the coating liquid as a positive structural element of the claimed apparatus. Claim 33 has also been amended to recite that "following startup of the apparatus and one or more circulations of the conductive transfer surface, the target region has a continuous coating of the liquid coating composition before newly applied drops land". Claim 34 has been editorially amended. As suggested in the Final Rejection, claims 38, 39 and 44 have also been amended. Antecedent basis for the amendments can be found in the Written Description at, e.g., page 7, lines 16 – 24, page 9, lines 21 – 22, page 10, line 12 and page 11, lines 17 – 21. Claims 33 – 59 will be pending after entry of this amendment.

Rejections under 35 U.S.C. § 112, second paragraph

Claims 38, 39 and 44 – 50 were rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicants regard as their invention. Applicants have amended claims 38, 39 and 44 as suggested in the Final Rejection, and accordingly request withdrawal of this rejection.

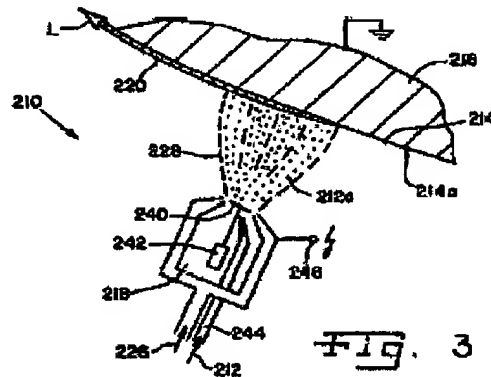
Rejection under 35 U.S.C. §102

As discussed during the interview, claims 33 – 35 were rejected under 35 U.S.C. §102(e) as being anticipated by Hess (U.S. Patent No. 6,503,325 B1). Hess describes the use of a steam chamber or steam jet to assist in coating "droplets and/or particles" onto a moving web (see e.g., col. 3, line 65 through col. 4, line 51), specifically a paper or cardboard web (see e.g., col. 1, lines 19 – 20). Hess's device appears to be intended for use primarily with powder coatings that would be applied as particles or dampened particles, not as droplets (see e.g., col. 2, lines 26 – 32 and col. 6, lines 24 – 38).

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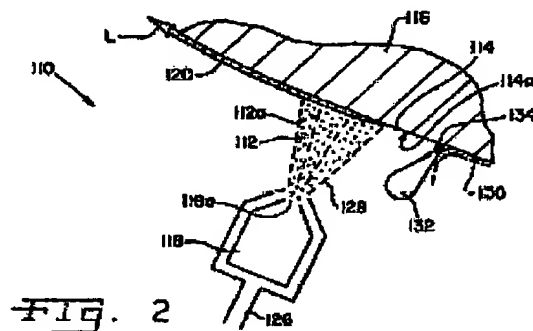
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Hess's Fig. 3 embodiment employs an electrostatically assisted spray nozzle (see also col. 2, line 63 through col. 3, line 5 and col. 6, lines 6 – 12):



As can be seen from Fig. 3, the target surface is not coated with liquid before newly applied particles land. The same is true for the target surfaces shown in the remaining Drawing figures, viz., Fig. 1, Fig. 2 and Fig. 4.

Hess recommends cleaning the target surface before applying a coating (see e.g., col. 5, lines 26 – 39). Hess’s Fig. 2 and Fig. 4 embodiments employ a steam jet to “scrape off” an air boundary layer on the incoming web (the Fig. 2 embodiment is shown below):



This would further ensure that Hess's target surface is not coated with liquid before newly applied particles land.

Hess mentions but does not actually show an embodiment with a transfer surface (see e.g., col. 1. lines 6 – 12 and col. 6, lines 39 – 43). The relevant passages are quite brief:

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"The present invention relates to the application of a coating medium by use of a spray device onto a moving surface, whereby in the direct application method the moving surface is the surface of a material web, specifically a paper or cardboard web, and in the indirect application method is the surface of a transfer element from which the coating medium is transferred to the material web." (col. 1, lines 6 – 12)

"Although the coating medium is applied directly to the material web in all three previously discussed design forms, it is also feasible for the coating medium to be applied to the surface of a transfer roll which then transfers the coating layer to the material web." (col. 6, lines 39 – 43)

For brevity, Hess's recited "transfer element" and "transfer roll" will be collectively referred to as a "transfer device". As acknowledged at page 5 of the Final Rejection, "Hess is silent as to how to utilize the spray head with the transfer rollers." No transfer device is actually shown in Hess, and Hess does not show how the transfer device and coating medium might interact with the material web. For example, Hess does not say whether the transfer device should be scraped clean following contact with the material web (as is done in the separately-cited Nakajima et al. device) or left as is, and Hess does not show whether the transfer device transfers all or only a portion of the coating medium to the material web. However, Hess's statements that the coating medium "is transferred to the material web" and that the transfer device "then transfers the coating layer to the material web" imply that the transfer device is scraped clean or that it transfers all the coating medium to the material web. Hess does not show a structure that transfers a portion of a liquid coating composition to a substrate, and does not show a structure that provides a target region having a continuous coating of a liquid coating composition before newly applied drops land.

Applicants accordingly request withdrawal of the rejection of claims 33 – 35 under 35 USC §102(e) over Hess.

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**Rejection of Claims 33 – 35, 37, 38, 43, 51, 52, 54
and 56 – 59 under 35 U.S.C. §103**

Claims 33 – 35, 37, 38, 43, 51, 52, 54 and 56 – 59 were rejected under 35 U.S.C. §103(a) as being unpatentable over Hess and Nakajima et al. (U.S. Patent No. 4,847,110).

According to the Final Rejection:

"Thus, one would look to Nakajima to implement the structures disclosed but not organized in Hess, and Nakajima's organization allows for metering of the coating composition. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have utilized the structural organization as disclosed in Nakajima for the elements of Hess as such an organization would allow for transfer and metering of the coating spray."

As noted above, Nakajima et al. scrape their transfer roll clean. If Hess and Nakajima et al. were combined as suggested in the Final Rejection, the result would not provide an apparatus with a target region having a continuous coating of a liquid coating composition before newly applied drops land.

Regarding claims 55 and 56 (which respectively recite that "the substrate is coated without substantial penetration of the coating through the substrate", and that "the substrate comprises a woven or nonwoven web"), the Final Rejection says that:

"As to claim 55, Hess and Nakajima is capable of using a liquid for coating wherein the coating does not substantially penetrate the porous structure."

and that:

"As to claim 56, Hess and Nakajima is capable of being used with a woven or nonwoven web."

Neither Hess nor Nakajima et al. actually show coating with a liquid, and neither Hess nor Nakajima et al. actually show coating a woven or nonwoven web. As explained in applicants' Written Description (see e.g., page 12, lines 3 – 12), applicants' invention is especially useful for coating liquids on porous substrates (especially on woven and nonwoven webs) without causing excessive penetration. This is nowhere suggested or recognized by Hess, Nakajima et al. or any proper combination thereof.

Applicants accordingly request withdrawal of the rejection of claims 33 – 35, 37, 38, 43, 51, 52, 54 and 56 – 59 under 35 U.S.C. §103(a) over Hess and Nakajima et al.

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Rejection of Claims 36, 42 and 53 under 35 U.S.C. §103

Claims 36, 42 and 53 were rejected under 35 U.S.C. §103(a) as being unpatentable over Hess and Nakajima et al. as applied to claims 33 – 35 above and further in view of Booth, *Evolution of Coating*.

As to claim 36 (which recites a belt), the Final Rejection acknowledges that Nakajima et al. does not disclose using a belt as the transfer surface. Nor does Hess. Booth is relied on in the Final Rejection for its disclosure of a belt on grounds that:

"Booth discloses using a belt and multiple transfer drums to transfer the coating liquid to the substrate (see page 37 to page 39, and Figures 40 and 41). Booth discloses that the steel belt is particularly well adapted to applying coatings to porous materials wherein a minimal "combining" pressure is needed (page 38, lines 7-10). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention with the desire to coat porous substrates to have added a belt for the transfer mechanism as suggested by Booth in the overall system of Nakajima in order to reduce damage to the substrate."

Booth does not say what minimal combining pressure is required in the described apparatus. Hess does not discuss combining pressure and does not strive to reduce it. Nakajima et al. also does not strive to reduce combining pressure and instead actually requires it (see e.g., col. 11, lines 29 – 32). Moreover, neither Hess nor Nakajima et al. discusses reducing "damage to the substrate" and thus would have no reason to look to Booth. Any asserted combination of Hess, Nakajima et al. and Booth must also take into account Booth's closing comments regarding steel belt casting:

"Cast coating in the paper industry is now a mature process with small increases in demand. Coating has become so much more sophisticated and competitive that slow speed processes such [as] casting cannot compete for a larger market share. Likewise, steel belt casting has high capital cost and high maintenance. With new processes such as Ultraviolet (UV) curing, the need for the special properties of belt casting are being preempted."

Clearly, these statements teach away from the modern-day use of steel belt casting. A person of ordinary skill of the art would heed all of the statements in Booth and would not be motivated to combine Hess, Nakajima et al. and Booth to make the invention of claim 36 as proposed in the Final Rejection.

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As to claims 42 and 53 (which respectively recite a plurality of circulating conductive transfer surfaces and a second transfer surface), Booth is relied on as follows:

"Booth discloses the use of multiple transfer surfaces (such as in Figures 30, 31, 32, 33 and 34, see pages 30-33) to meter the coating. Booth discloses that such multiple transfer surfaces are useful for maintaining coating weight control and uniformity (see page 30, lines 12-15). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to [use] a plurality of circulating transfer surfaces wherein the coating is transferred from a first surface to a second transfer surface as disclosed in Booth in order to maintain coating weight control and uniformity."

Booth, Hess and Nakajima would not be combined as suggested in the Office Action. As noted above, Hess focuses on applying powder coatings to paper or cardboard. As noted previously, Nakajima involves the application of solid or semisolid image forming element particles to a target substrate. Transfer of an applied powder, solid or semisolid coating is not easy. Hess and Nakajima et al. would have no motivation to add an additional transfer surface to their respective devices. Doing so would increase capital cost and decrease reliability, without providing any material advantage for their intended coating applications.

Applicants accordingly request withdrawal of the rejection of claims 36, 42 and 53 under 35 USC § 103(a) as being unpatentable over Hess and Nakajima et al. in view of Booth.

Rejection of Claims 38 – 41 under 35 U.S.C. §103

Claims 38 – 41 were rejected under 35 U.S.C. §103(a) as being unpatentable over Hess and Nakajima et al. as applied to claim 33 above and further in view of Neidich (U.S. Patent No. 2,833,666).

According to the Final Rejection:

"One in the art would appreciate that the use of multiple applicator nozzles allows for the treatment of a wider substrate, thus improving the efficiency of the application operation, and would appreciate that such a multiple nozzle setup plus transfer roller as in Hess/Nakajima would allow for the coating of wider substrates. Therefore, it would have been obvious to one of ordinary skill in the

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art at the time of the invention to have utilized multiple applicator nozzles such as in Neidich in the overall apparatus of Nakajima in order to improve efficiency and improve production speed."

However, as acknowledged in the Final Rejection, Neidich does not employ electrostatic spray nozzles or a transfer surface. As noted above, neither Hess nor Nakajima et al. actually show coating liquid compositions. Except for the fact that all three references involve coating, there is no real basis for selecting Neidich from among the thousands of references that generally involve coating and combining it with Hess and Nakajima et al. as proposed in the Final Rejection. If the proposed combination of Hess, Nakajima et al. and Neidich was nonetheless made, the result would not provide an apparatus with a target region having a continuous coating of a liquid coating composition before newly applied drops land.

Applicants accordingly request withdrawal of the rejection of claims 38 – 41 under 35 U.S.C. §103(a) as being unpatentable over Hess and Nakajima et al. in view of Neidich.

Rejection of Claims 44 – 50 under 35 U.S.C. §103

Claims 38 – 41 were rejected under 35 U.S.C. §103(a) as being unpatentable over Hess and Nakajima et al. as applied to claim 33 above and further in view of Hall (U.K. Patent No. 1,278,099).

According to the Final Rejection:

"Hess and Nakajima do not disclose multiple pick and place devices.

"Hall discloses multiple pick and place devices, and further discloses that a minimum of five rollers, sometimes two rollers, be used per side coated (column 1, lines 41 –46). Hall discloses that such devices smooth the coating, thus improving the coating. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have utilized such rollers in order to improve the coating."

As noted above, neither Hess nor Nakajima et al. actually show coating liquid compositions. Except for the fact that all three references involve coating, there is no real basis for selecting Hall from among the thousands of references that generally involve coating and combining it with Hess and Nakajima et al. as proposed in the Final Rejection.

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If the proposed combination of Hess, Nakajima et al. and Hall was nonetheless made, the result would not provide an apparatus with a target region having a continuous coating of a liquid coating composition before newly applied drops land.

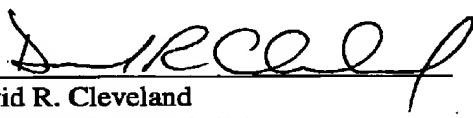
Applicants accordingly request withdrawal of the rejection of claims 44 – 50 under 35 U.S.C. §103(a) as being unpatentable over Hess and Nakajima et al. in view of Hall.

Conclusion

None of the cited references whether taken alone or in any proper combination shows an apparatus with a circulating conductive transfer surface in which following startup of the apparatus and one or more circulations of the conductive transfer surface, a target region on the conductive transfer surface for applied drops has a continuous coating of the liquid coating composition before newly applied drops land. The remaining rejections have been rendered moot by this Amendment. Applicants accordingly request reconsideration and withdrawal of the rejections made in the Final Rejection and passage of this application to the issue branch.

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May 19, 2002


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